User Guide



Power Unit

- ◆ Support for optional Redundant
  - ♦ Plug and play
  - ◆ EZ Fast Ethernet migration
    - ♦ Internal switch
       ♦
- ◆ 74 10BYSE-L\100BYSE-LX borts
- ◆ 17 10BYSE-L\100BYSE-LX borts
  - Dual Speed Hubs

    Two models with either:

# SWC2015DS' SWC2054DS

# •EZ Hnp 10/100

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## Bulletin Board Services (BBS)

Modem settings: 9600,8,n,1 unless otherwise noted New York: (516) 434-3162 (connect speed up to 14,400) United Kingdom: 44 (0) 1344 418838

## INTERNET

e-mail addresses: techsupport@smc.com

european.techsupport@smc.com

Driver updates:

Host name info.smc.com

 $SMC\ Forum\ on\ CompuServe:$ 

At the prompt (!) type: GO SMC

World Wide Web: http://www.smc.com/

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## **COMPLIANCES**

#### **FCC Class A**

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Subpart B of Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. Its operation in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

#### **EC Conformance Declaration**

European contact: SMC (Europe) Limited

1st Floor, Pyramid House, Easthampstead Road

Bracknell, Berkshire RG12 1NS, United Kingdom

This information technology product complies with ISO/IEC Guide 22 and EN45014 It conforms to the following specifications:

EMC: EN55022/CISPR-22

IEC 1000-4-2, -3, -4, -6

This information technology product complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

## **Industry Canada - Class A**

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matérial brouilleur: "Appareils Numériques", NMB-003 édictée par l'Industrie.

## **VCCI Class A**

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## Australia AS/NZS 3548 (1995) Class A

Australian contact:

ACN 069 351 613

SMC Communications Pty Ltd
Level 10, 201 Miller Street
North Sydney NSW

Australia 2060

Phone: 61-2-9929-9159; Fax: 61-2-9929-9140

# SAFETY COMPLIANCE

UL 1950

CSA 22.2 No. 950

EN60950, (IEC 950)

The unit automatically matches the mains voltage. Therefore, no additional adjustments are necessary for any mains voltage within 100 - 240V. If you need to change the AC line cord set, be sure

the AC line cord set, be sure the cordage is HAR Certified (marked "<HAR>").



Publication Number: 900.238, Rev. A

# EZ Hub 10/100 Specifications

#### Model SMC5612DS

**Ports** 

Port 1: RJ-45, Twisted-pair, switch-selectable crossover Ports 2-12: RJ-45, Twisted-pair, fixed crossover

#### Model SMC5624DS

**Ports** 

Port 1: RJ-45, Twisted-pair, switch-selectable crossover Ports 2-24: RJ-45, Twisted-pair, fixed crossover

#### 11 37 1 1

## Internal Switching

8 K MAC address table
Store and forward switching method
256 Kbyte buffer per segment
Filtering, forwarding and learning network bridging functions
Line speed forwarding and filtering rates

## 10BASE-T Ethernet Interface

100 Ohm UTP, EIA/TIA Categories 3, 4, or 5

## 100BASE-TX Fast Ethernet Interface

100 Ohm UTP, EIA/TIA Category 5

## *LEDs*

Pwr (Power) - one RPU - one

Partition - one per port Link - one per port

Col (Collision) - one per segment Act (Activity) - one per segment

#### **Button**

Port 1 daisy-chain select

## Size

17.0 in. W x 9.4 in. D x 1.7 in. H (43.2 cm x 24 cm x 4.35 cm)

#### Weight

5 lb. (2.25 kg)

#### **Operating Temperature**

32° to 113° F (0° to 45° C)

#### Humidity, non-condensing

10% to 90%

# Power Requirements

Universal AC input 100 V to 240 V, 50 to 60 Hz

## **Power Consumption**

26 W (max.)

# Standards

ANSI/IEEE 802.3, 802.3u ISO/IEC 8802-3

## Limited Warranty

Three years

## **CABLE SPECIFICATIONS**

## **Cable Types and Connectors**

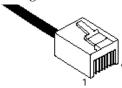
Cable Types and Connectors			
Cable	Туре	Length	Connector
10BASE-T	Categories 3, 4 or 5	100 m (328 ft.)	RJ-45
100BASE-TX	Category 5	100 m (328 ft.)	RJ-45

## **RJ-45 Connector Pin Assignments**

**Caution:** Regulations regarding the connection of equipment to telephone networks vary from country to country. Check with your local telephone network supplier *before* using existing telephone wiring.

An Ethernet or Fast Ethernet twisted-pair link segment requires two pairs of wires. Each wire pair is identified by two different colors. For example, one wire might be green and the other, green with a white stripe

Each wire pair must be attached to the RJ-45 connector in a specific orientation. Note how the pins are numbered in the illustration below. Be sure to hold the connectors in the same orientation when attaching the wires to the pins





RJ-45 Pin Assignments Straight-Through Cable		
End 1	End 2	
1 (Tx+)	1 (Tx+)	
2 (Tx-)	2 (Tx-)	
3 (Rx+)	3 (Rx+)	
6 (Rx-)	6 (Rx-)	

	Crossover Cable		
	End 1	End 2	
	1 (Tx+)	3 (Rx+)	
	2 (Tx-)	6 (Rx-)	
	3 (Rx+)	1 (Tx+)	
	6 (Rx-)	2 (Tx-)	
enresent the polarity of the two			

<sup>\*</sup> The "+" and "-" signs are used to represent the polarity of the two wires that make up each wire pair.

# **CONNECTIVITY GUIDELINES**

Maximum Cable Distance		
Cable Type	Connecting	Max. Distance
Twisted Pair	Any two devices	100 m (328 ft.)

Crossover/Straight-Through Wiring Requirements			
If the EZ Hub 10/100 port is	And the port on the other device is	Then usecable	
Crossover (x)	Straight-through	Straight-through	
Crossover (x)	Crossover	Crossover	
Straight-through (=)	Straight-through	Crossover	
Straight-through (=)	Crossover	Straight-through	

Maximum Fast Ethernet Network Diameter			
Repeater Type   Twisted Pair   Twisted Pair/Fiber		air/Fiber	
and Number	100BASE-TX/T4	100BASE-T4/FX	100BASE-TX/FX
1 Class ①	200 m (656 ft.)	231 m (757.7 ft.)	260.8 m (855.4ft.)
1 Class (II)	200 m (656 ft.)	304 m (997.1 ft.)	308.8 m (1012.9 ft.)
2 Class (II)	205 m (672.4 ft.)	236.3 m (775.1 ft.)	216.2 m (709.1 ft.)

**Note:** Network Diameter is defined as the wire distance between two end stations in the same collision domain.

# ABOUT THE **EZ** HUB **10/100** SMC5612DS, SMC5624DS

SMC's EZ Hub<sup>™</sup> 10/100 repeaters provide either 12 or 24 ports for 10 Mbps Ethernet or 100 Mbps Fast Ethernet connections. Use these plug and play hubs in a 10BASE-T network and, when you need additional bandwidth, connect as many ports as necessary to 100BASE-TX devices. These dual-speed hubs contain two internal repeater buses, one for 10 Mbps traffic and the other for 100 Mbps traffic.

An internal Ethernet/Fast Ethernet switch, consisting of a 10 Mbps port and a 100 Mbps port, is used to link the two repeater buses, and learns the MAC address of each connected device. Data will be forwarded across this switch if traffic must be passed between 10 Mbps and 100 Mbps devices, a destination MAC address is not found in the address table, or broadcast traffic is sent.

These hubs provide a low-cost connection between 10 Mbps and 100 Mbps networks, and the comprehensive LED display panel provides a friendly interface that simplifies installation and network troubleshooting.

## **Front Panel**

## **Ports and Daisy-Chain Button**

All the RJ-45 connectors and the daisy-chain button are located on the front panel of these hubs. Ports 2 through 12 on the SMC5612DS hub, and ports 2 through 24 on the SMC5624DS hub, are labeled with an "X" to indicate that they have a built-in crossover. PCs can be connected to these ports with straight-through cable. The daisy-chain push-button switch is used to enable and disable the crossover on Port 1 of each hub.

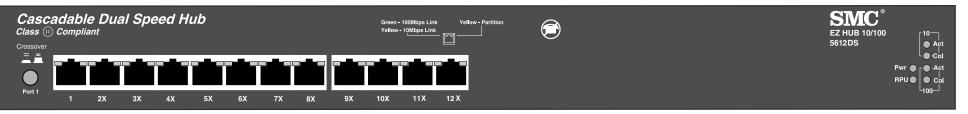
Status LEDs are also located on the front panel for easy viewing. The functions of the LEDs are described in the tables below.

Power Supply Status LEDs			
LED Condition Pwr (Power) RPU		Status	
Off	Off	No power	
Green	Off	Internal power supply is operating properly; RPU not connected	
Green	Green	Both internal and redundant power supplies are operating properly	
Red	Off	Internal power supply has failed; RPU not connected Internal power supply functioning; RPU failed	
		Internal power supply functioning; RPU connected, but not receiving power	
Red	Green	Internal power supply has failed; device is being powered by redundant power supply	

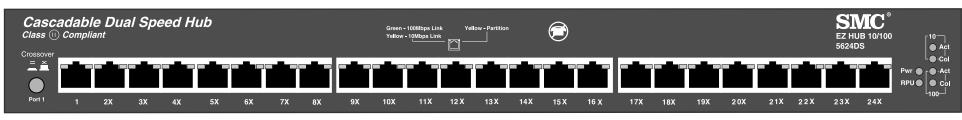
Port and Segment Status LEDs			
LEDs	Condition	Status	
Integrated LEDs			
Link	Off	Port is not in use, attached device is not powered on, or connection is bad	
	Yellow	10 Mbps link between hub and attached device is good	
	Green	100 Mbps link between hub and attached device is good	
Partition	Off	Port is not partitioned	
	Yellow	Port has been partitioned due to an abnormal condition	
Act (Activity)	Green (flashing)	There is traffic (activity) present on the segment	
<b>Col</b> (Collision)	Yellow (flashing)	A collision has been detected (i.e., the hub is receiving data from two or more nodes simultaneously)	

## **Rear Panel**

The power receptacle and DC input connector for the optional Redundant Power Unit (SMC-RPUX1 or SMC-RPUX5) are located on the rear panel of these hubs.



SMC5612DS Front Panel - LEDs and RJ-45 Connectors



SMC5624DS Front Panel - LEDs and RJ-45 Connectors



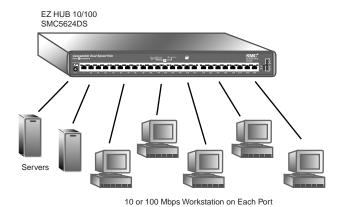
Rear Panel - (For Both Models)

#### **Features and Benefits**

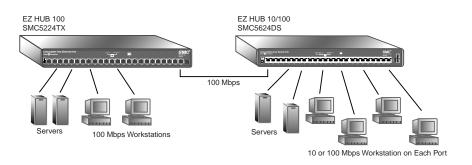
- ◆ Low cost of ownership
- ◆ ANSI/IEEE 802.3, 802.3u compliance ensures compatibility with standards-based hubs, switches and network cards from any vendor
- ◆ Easy integration of Ethernet and Fast Ethernet LANs
- ◆ 12 or 24 dual-speed ports for easy connectivity to 10BASE-T and 100BASE-TX devices
- ◆ Plug and play—no software to load or configure
- ◆ Desktop or rack-mountable
- ◆ Comprehensive array of LEDs to display hub activity and port status information
- ◆ Self-diagnostic test upon power on
- ◆ Automatic partitioning and reconnection to minimize network downtime
- ◆ Cascadable Class (II) Fast Ethernet repeater
- ◆ Daisy-chain port for easy hub or switch connection
- ◆ Optional Redundant Power Unit (attached to a separate circuit) minimizes downtime in the event of an AC power failure

## SAMPLE APPLICATIONS

Some typical applications for the EZ Hub 10/100, models SMC5612DS and SMC5624DS, are illustrated below:



**Standalone LAN** 



**Network Expansion via Daisy-Chain Port** 

## **INSTALLING THE HUBS**

The EZ Hub 10/100 unit can be placed on a desktop or shelf or installed in a standard 19-inch equipment rack.

## **Equipment Checklist**

After unpacking your EZ Hub 10/100 carton, check the contents to be sure you've received the following components:

• One EZ Hub 10/100 repeater

SMC5612DS - 12 dual-speed RJ-45 ports or; SMC5624DS - 24 dual-speed RJ-45 ports

- Appropriate Power Cord
- Rack-Mount Kit
- Four Adhesive Feet
- SMC Warranty Registration Card
- This User Guide

## Selecting a Site

Be sure to follow the site selection guidelines below when choosing a location:

- ◆ Select a suitable location for the hub:
- It should be accessible for installing, cabling, and maintaining the hub.
- The temperature and humidity should be within the ranges listed in the specifications, out of direct sunlight, and away from heat sources or areas with high amounts of electromagnetic interference.
- The status LEDs should be clearly visible.
- There should be adequate space (recommended minimum of two inches) on all sides for proper air flow.
- ◆ Before rack mounting the hub, pay particular attention to the following factors:
- *Temperature*: Since the temperature within a rack assembly may be higher than the ambient room temperature, check that the rack-environment temperature is within the specified operating temperature range.
- *Mechanical Loading*: Do not place any equipment directly on top of a rack-mounted hub.
- *Circuit Overloading*: Be sure that the electrical supply circuit to the rack assembly is not overloaded.
- Grounding: Rack-mounted equipment should be properly grounded. Particular attention should be given to supply connections other than direct connections to AC power mains.
- ◆ Make sure twisted-pair cable is always routed away from power lines, fluorescent lighting fixtures and other sources of electrical interference, such as radios, transmitters, etc.
- ◆ Make sure that a properly grounded power outlet is within 8 feet (2.44 m) of the hub. The power supply automatically detects the input voltage level. As with any equipment, using a filter or surge suppressor is recommended.

## **Operating Instructions**

- 1. **Positioning the Hub:** For desktop or shelf mounting, attach the four adhesive feet to the bottom of the hub. For rackmounting, attach the mounting brackets on both sides of the hub with the screws provided, and install the hub in the rack.
- 2. **Applying Power:** Plug one end of the power cable into the power receptacle at the back of the hub, and the other end into an appropriate electrical outlet. Check the Power LED to be sure power is on.

**Note:** It is not necessary to power off the hub before connecting or disconnecting any UTP cables, as these actions *will not* disrupt the operation of other devices attached to the hub.

- 3. **Connecting PCs:** Connect each PC to an RJ-45 port on the hub with a straight-through twisted-pair cable segment, maximum 100 meters (328 ft.). The EZ Hub 10/100 hub will support 12 or 24 PCs, depending on the model. However, before connecting Port 1 to a PC, be sure to enable the crossover. For the type of UTP wiring to be used, refer to the Crossover/Straight-Through Wiring Requirements table under "Connectivity Guidelines."
- 4. **Cascading Hubs and Other Network Devices:** If you need more ports, connect a crossover port on another device to the daisy-chain port, Port 1, on the hub with straight-through twisted-pair cable, maximum 100 meters (328 ft.). For further information refer to Connectivity Guidelines.

When cascading Ethernet hubs, be sure to refer to the **SMC 5 - 4 Rule**, shown below.

#### The SMC 5 - 4 Rule for 10BASE-T Ethernet

Between any two PCs or other stations in the same 10BASE-T collision domain, there may be:

- up to 5 link segments in series,
- up to 4 repeaters (hubs)

When making Fast Ethernet connections, remember that only two hubs can be cascaded, and that the diameter is limited to a maximum of 205 meters (672.4 ft.). Refer to the **SMC 3 - 2 Rule**, shown below.

#### The SMC 3 - 2 Rule for 100BASE-TX Fast Ethernet

Between any two PCs or other stations in the same 100BASE-TX collision domain, there may be:

- up to 3 link segments and,
- up to 2 Class (II) repeaters (hubs)

# **TROUBLESHOOTING**

## **Symptom**

Link LED does not light after connection is made.

## **Probable Causes**

Hub port, network card or cable may be defective.

## **Possible Solutions**

- Check that hub and attached device are both powered on.
- Be sure the network cable is connected to both devices.
- Verify that the proper cable type is used and that its length does not exceed specified limits.
- Check the network card and cable connections for defects.
- Replace the defective card or cable if necessary.

## Symptom

Partition LED is on (yellow).

## **Probable Causes**

A line error or an excess number of collisions have been detected on the segment.

## **Possible Solutions**

• Port is reconnected automatically when problem is corrected or valid data is received.